



R/V Fay Slover: New Research Vessel Enhances Old Dominion's Oceanographic Research Capabilities

BY ELIZABETH O. COOPER

Trading in a 48-year-old car for a new model is how Thomas Royer, chair of Ocean, Earth and Atmospheric Sciences and eminent professor of oceanography and Samuel L. and Fay M. Slover chair in oceanography, compares Old Dominion's sleek, new 55-foot research vessel, the R/V Fay Slover, with its previous craft, the R/V Linwood Holton, which served the university for three decades. Royer and other faculty involved in oceanographic research are excited about the new vessel and its state-of-the-art capabilities. In a recent interview, he shared how the Slover came into being and the department plans to use it to conduct research in the Chesapeake Bay and the Gulf Stream.

A bottle system electronically collects 12 different water samples.



How is the R/V Fay Slover an improvement over the R/V Linwood Holton? The Holton was a T-boat that was built in 1954 for the Korean War although it never served in Korea. It was put in mothballs. Capt. (Robert) Bray, research vessel supervisor, Ocean, Earth and Atmospheric Sciences, found it in 1971 and got it for the university to do oceanographic research, which it did for 30 years. The Holton could only go at top speeds of nine knots, but the Slover can go up to 22 knots. It was primarily a platform vessel. It didn't have much in the way of instruments. If you wanted to find out your position using the Global Positioning System, you would have to use your own because the vessel didn't have one. The Slover has a 200-square-foot wet and dry laboratory with 32 kilowatts of electrical power that can be used for sample processing, electronic monitoring, remote control operations or data recording.

How did Old Dominion go about constructing and purchasing the Slover? In the university's first capital campaign in 1995, the department received \$1.3 million to build the vessel. We formed a ship committee to look at possible designs in 1998. We saw a similar ship in the Gulf of Maine – the Gulf Challenge owned by the University of New Hampshire. We hired a marine architect, the Gulf Challenge designer and the shipyard that built it to build the Slover in 2000. It was built in Somerset, Mass. Construction began in October 2001, and we accepted it in September 2002. We specified what we wanted on board based upon faculty input. We took the contract the University of New Hampshire had for the

“(The Slover) was an eye opener for the faculty. It was a very pleasant surprise to finally have the new research vessel and its equipment available to go to sea.”

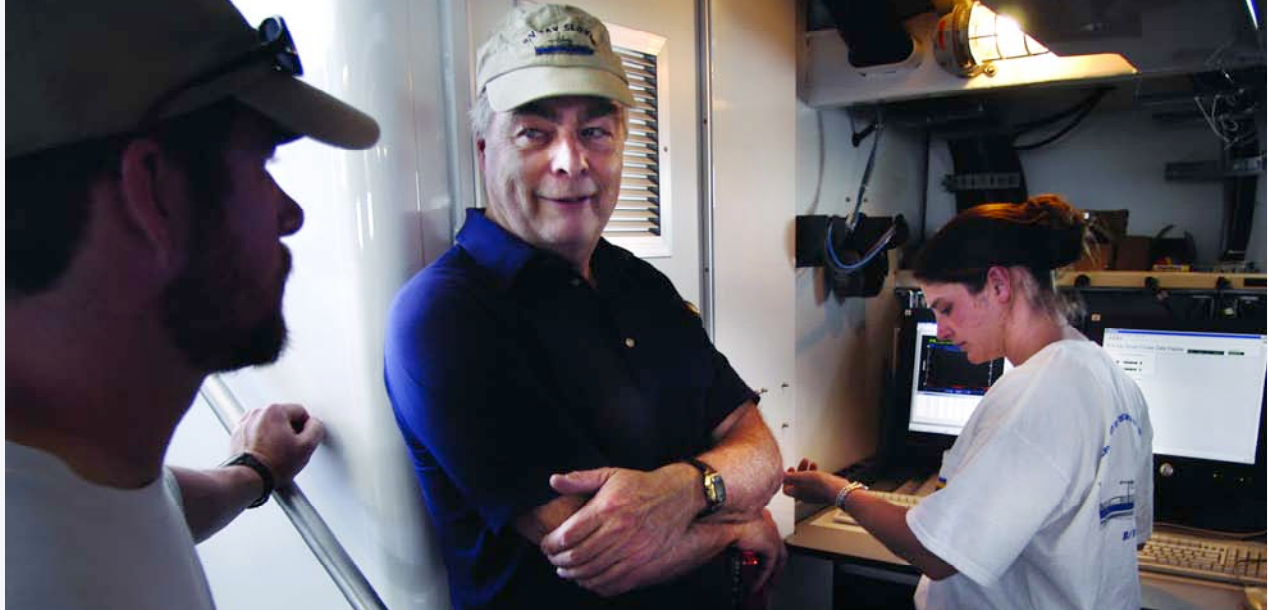
Gulf Challenge and modified it. We also received \$140,000 from the National Science Foundation for new equipment, and we matched that grant, so there is about one-quarter of a million dollars in new equipment on the boat.

What types of high-tech equipment are on the Slover? We have three Global Positioning Systems. We have a profiling system that can measure vertical profiles of temperature, salinity, dissolved oxygen, fluorescence and light transmission. We have a sea surface salinity and temperature fluorescence light transmission. We have an Acoustic Doppler Current Profiler that measures currents throughout the water collected beneath the ship and can subtract the ship's speed so we get the currents relative to the earth. There is a complete suite of meteorological instruments for wind speed and direction and air temperature and relative humidity. We are going to put in photosynthetic-available radiation, which is essentially solar radiation. It gives you an indication of how much sunlight is available for photoplankton to develop.

All of these are underway systems. You turn the ship on, and everything records automatically on the shipboard's computer every four seconds. You end up with a lot of information.

There is a bottle system where you can collect water samples at 12 different departments. You trip the system and collect samples electronically. We're in the process of purchasing a box corer so we can gather sediment samples. It's the standard suite of instruments found on any large research vessel, except we've got it on a small research vessel.

The R/V Fay Slover features sophisticated instrumentation usually found on larger research vessels, says Thomas Royer, OEAS chair.



How does the R/V Fay Slover compare to other research vessels? I claim it is one of the best equipped per foot in the world. The one it compares to around here is the Cape Fear, which is run out of the University of North Carolina at Wilmington. It's very similar to that one but more modern and faster. It's also similar to the Bay Eagle, which is run out of the Virginia Institute of Marine Sciences, except the Bay Eagle doesn't have the equipment we do and it's not as fast.

How far can the R/V Slover travel at a time? It can travel 600 miles on 2,000 gallons of fuel. It was designed to have a three-day endurance.

Where will the R/V Fay Slover be used primarily? It was designed for the lower Chesapeake Bay. Its air conditioning and heating system was designed for that latitude, and all the sampling gear was designed for the water here. We've staked out the lower Chesapeake Bay as our area of operations with the idea that we will go out to the Gulf Stream. A faculty member will probably take it off Cape Hatteras. But it will do things up and down the coast. That's a significant difference from the Holton, which was limited in range. If the winds were above 15 knots, the Holton couldn't operate. A major difference is the sea-keeping ability of this vessel. It performs quite well in rough seas. That's one of the things that attracted us to this particular design. A smaller vessel performs better in rough seas.

What are the initial research plans for the Slover? Proposals have been generated to use the vessel to deal with the lower Chesapeake Bay. We're looking at the inflow and outflow of the exchange of ocean and fresh water across the bay's mouth, transport of pollutants into and out

of the bay and inflow of salt water in the bay and outflow of heat in the bay. Also, we want to conduct water quality work. John Donat, associate professor of chemistry and biochemistry, is doing monthly surveys of water quality of the lower Chesapeake Bay.

What does the department hope to achieve with the Slover? We hope it will be used for research and education. We plan to take students out on it and expose them to marine studies. In terms of research, we're looking at some interesting scientific results to come out of that. Primarily we will look at the exchange of Chesapeake Bay water with the open ocean. With the interest in global warming, we want to see what's going to happen to the Chesapeake Bay with the additional warm water coming in to it. We don't know how the bay water will respond.

It's also been predicted that the amount of precipitation will change. We also plan to look at harmful algal blooms, such as red tides, outbreaks of various organisms that may or may not be related to physical parameters and salinity. Typically vessels of this size are used approximately 200 days a year. We're not concerned that it won't be utilized.

What are some of the faculty research proposals for the Slover? Jay Austin, research assistant professor of ocean, earth and atmospheric sciences, wants to take monthly cruises to the mouth of the Chesapeake Bay to determine the climatology of the bay. Dana Savidge, research assistant professor of ocean, earth and atmospheric sciences, has proposals to do research off Cape Hatteras. Fred Dobbs, associate professor of oceanography, and Margaret Mulholland, assistant professor of ocean, earth and atmospheric sciences, want to do interdisciplinary studies in the

lower Chesapeake Bay. Glenn Cota, research professor, oceanography, is doing ground-truthing for NASA to check if satellite sensors measure the right thing. They measure colors and sea and surf.

What other research projects are you considering for use with the Slover? We're talking about putting together a proposal to look at the Norfolk Canyon which is the connection between the waters of the lower Chesapeake Bay and out to the shelf break. It has not been studied in any great detail. It could be a conduit for the Gulf Stream to move up onto the shelf and keep us warm and toasty.

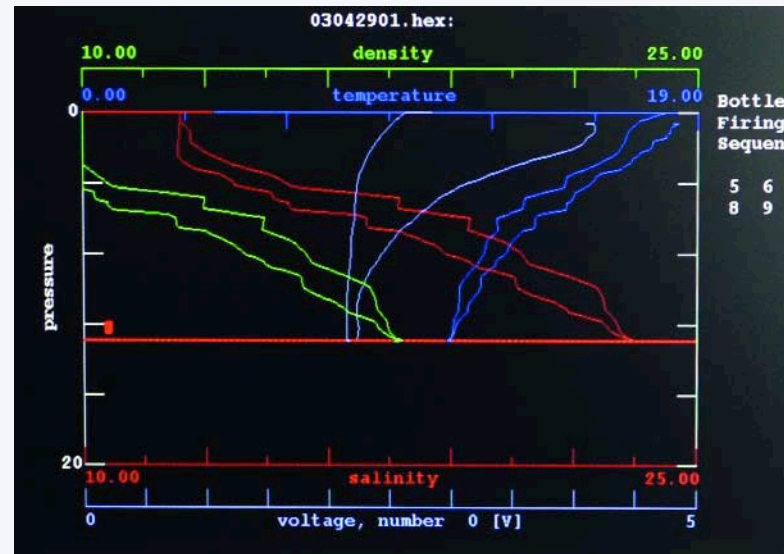
What does the department hope to learn about the Chesapeake Bay through the Slover? We want to understand the circulation of the bay better. We've established a baseline as far as the climatology goes. We want to see if there are any changes in those. We're also looking at global warming, changes in fisheries, changes in the response of the bay to man's influences such as dredging the bay.

What do you hope to learn about the Gulf Stream? We're primarily going to look at things on the shelf. How do heat and salt from the Gulf Stream move across the shelf? Are eddies important to conditions just off the beach? There's a whole realm of shelf circulation that has not been studied much in that region. We haven't had a platform available.

Do many universities own research vessels? No. Within the big operators, 28 universities have research vessels of 100 feet or greater. Most smaller institutions that do oceanographic research have some sort of vessel. Within Virginia, only the Virginia Institute of Marine Sciences and Old Dominion have what I would call minor research vessels, as opposed to small boats of less than 30 feet.



What are the Slover's best features? Its suite of instrumentation and high speed and sea-keeping capabilities are at the top of the list. The designer says its sea-keeping features can work better than people can in high seas. People give up before the ship will.



How will it be used for education? We will take students out on it. Introductory oceanography classes will spend time on it. Sea Camp will use it in the summer. I'm taking a sampling techniques class out on it. It's an opportunity for students to get out in the Chesapeake Bay and coastal waters.

What has been the faculty's reaction to the Slover? The Slover was christened on Oct. 1, 2002. It was an eye opener for the faculty. After talking about getting a new vessel for a decade and then nothing appears, you start to think it will never appear.

Although the Slover is primarily used by the Center for Coastal Physical Oceanography and the Department of Ocean, Earth and Atmospheric Sciences, requests for ship time are welcomed from anyone. For more information about the Slover and charter rates, please contact Ship Scheduling Officer, Old Dominion University, Department of Ocean, Earth and Atmospheric Sciences, Norfolk, VA 23529-0276, (757) 683-5631, sdouglas@odu.edu or 683-4685, moody@ccpo.odu.edu.